Public Page for Quarter Ending November 30, 2007

Consolidated Program for Research and Development for Welding of High Strength Steel Pipelines, #277 & 278

Project 277: Update of Weld Design, Testing, and Assessment Procedures for High Strength Pipelines

Background

High strength pipelines are expected to become a major player in long distance onshore hydrocarbon transportation. Understanding the differences between the modern high strength and older-generation linepipes is critical to the safe and economical application of those modern materials. The objectives of this project to fill the critical gaps and provide guidelines on the effective use of high strength linepipes, from design and testing to weld integrity assessment procedures. The interdependence of linepipe materials, welding processes, design requirements, and weld integrity will be investigated to enable realistic and effective use of high strength linepipes.

Progress in the Quarter

The activities in the first quarter of this project covered (1) project planning, (2) coordinating with Project #278 on secure linepipes for specimen fabrication, (3) reviewing linepipe specifications, (4) developing weld metal tensile and toughness testing protocols, and (5) preparing for medium scale testing.

The project kick-off meeting was held on October 16, 2007, in Atlanta. The project team reviewed and revised the project plan. A near-term action plan was formulated. Two more web-conferences were held following the kick-off meeting to review the progress on the near-term action plan. The possible sources of linepipes for specimen fabrication were discussed at those conferences. The project team is following up with those sources. Literature review of linepipe property specifications has been started. The review included current codes and standards and specifications of X100 linepipes for different design conditions. Work is under way to address girth weld tensile strength test methods using a range of specimen geometries, including standard round bars, full-strip and split-strip tensile specimens. The development of fracture toughness testing protocol is under way with both experimental testing and numerical simulation. SE(B) and SE(T) specimens have been machined and tested. Preparation for medium scale testing includes the design and fabrication of grips, design of cooling chambers, updating of test machine controllers, and development of possible procedures for specimen fabrication.